

## Effective Light Management of Three-Dimensionally Patterned Transparent Conductive Oxide Layers

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For effective light harvesting, a design weighting should be implemented in a front geometry, in which the incident light transmits from a surface into a light-active layer. We designed a three-dimensionally patterned transparent conductor layer for effective light management. A transparent conductive oxide (TCO) film was formed as three-dimensional structures. This efficiently drives the incident light at the front surface into a Si absorber to yield a reduction in reflection and an enhancement of current. This indicates that an optimum architecture for a front TCO surface will provide an effective way for light management in solar cells.

**Keywords:** Light management, Three-dimension, Transparent conductor, Patterns